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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: William A. Cox  
Serial Number: 09/863,181  
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Examiner/Art Group Unit: Peterson, Kenneth E./3724  
Title: ROTARY DIE MODULE

DECLARATION UNDER 37 C.F.R. 1.132

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Alan R. Pfaff, Jr., do hereby declare that I make this declaration based on personal knowledge and am competent to testify on the matters herein.

1. My educational background includes three plus years at Michigan State University plus numerous continuing education courses and technical seminars, many of which were specific to rotary die manufacturing, cutting and cutting systems.

2. I am the founder and principal owner of Bernal Rotary Systems, Inc, Atlantic Eagle, Inc. and Eagle Rotary Systems Inc. I served as the president at Bernal for 20 years and as president and chairman of Atlantic Eagle for 5 years and

Eagle Rotary Systems for 2 years. These companies all specialized in the design and manufacture of rotary die cutting machines and related equipment.

3. I have over 35 years experience in the design and manufacture of rotary die machines and rotary cutting dies and tools.

4. I am a named inventor on an estimated 15 patents relating to rotary die cutting devices including:

a. U.S. Patent No. 6,178,852 for rotary die laser machining and hardening apparatus method.

b. U.S. Patent No. 5,575,185 for a method of making rotary cutting dies.

c. U.S. Patent No. 5,417,132 for rotary cutting dies.

5. I am presently a principal shareholder and president of Eagle Rotary Systems, Inc. a company specializing in the engineering and manufacturing of rotary dies and related equipment.

6. With my extensive experience in rotary cutting die design and manufacturing, and educational background, I believe that I am skilled in the art of rotary die equipment and consider myself to be an expert in this field of technology.

7. Inventor William Cox was formerly employed by Bernal Rotary Systems, Inc. and Atlantic Eagle, Inc. during the period that I owned those two companies.

8. I have no financial or other interest in Mr. Cox's Rotary Die Module invention (hereinafter "Rotary Die") and have no financial interest in the outcome of whether the application will be granted a patent. I have no formal affiliation or business relationship with Mr. Cox or his business The Cox Group, Inc.

9. I have reviewed the Rotary Die invention which I understand is the subject of U.S. Patent Application number 09/863,181 (hereinafter the "Patent Application").

10. I believe there are several aspects of the Rotary Die that I have not seen in the rotary die technology field and that I believe are important advancements.

11. The first advancement is the elimination of the need for heavy, precisely machined frame side plates to support and constrain the rotary die rolls from linear movement. I generally agree with the description of the need for heavy machined side plates in prior designs in the Rotary Die Background of the Invention section of the Patent Application. The Rotary Die uses rods or other common stock which, along with the individual roller bearings supporting the dies, requires little or no

machining in the areas directly adjacent the rollers as they are independent of the side frame.

12. The second advancement is the elimination of cylindrical roller bearings or bearing blocks which have been used with journals extending from the die rolls. I generally agree with the description of the need for bearing blocks in the prior designs in the Rotary Die Background of the Invention section of the Patent Application. The disclosed low speed version of the Rotary Die does not use cylindrical roller or sleeve bearings engaging die roll journals. Individual rollers are exclusively used as the die roll bearings.

13. In my experience, I have not personally seen and am not aware of a production rotary cutting device that does not use at least one cylindrical roller or sleeve bearing in combination with a die roll journal.

14. The third advancement, which is related to the first and second design having the advancements above, is the use of an annular flange or flanges on one or both of the die rolls to prevent linear movement of the die rolls along the rotational axis of the die rolls.

15. In my experience, prior designs have principally relied on cylindrical roller or sleeve bearings in combination with a machined side plate to control linear

movement of the die rolls in directions along the die roll axis of rotation and transverse to the die roll axis of rotation.

16. I have reviewed U.S. Patent number 4,770,078 for a Roll-Type Cutting/Scoring Apparatus by inventor Jean Gautier (hereinafter "Gautier").

17. Pertinent to the Patent Application, the '078 patent discloses a rotary die device having a frame 7 including a machined U-shaped channel on one side. Figure 4 (right side). The other side of the frame includes an open window design so sleeves or tubes 19 and 20 can axially pass through. Figure 5, column 3 lines 10-24.

18. The Gautier patent discloses use of two die rolls 1 and 2 which include expansible arbors and sleeves 19 and 20. Each die roll includes a stub shaft or journal 9 and 10 on the drive side (right hand side of the frame) which engage journal blocks or bearings 3 and 4. Figure 4, column 3 lines 10-24. The journal block bearings 3 and 4 which support the stub shafts are disclosed as being supported by the frame 7. Column 3 lines 19-24. In the absence of a separate elevational figure for the right side of the frame like that shown in figure 5, or a contrary description, I understand the disclosure of the relationship of these components on the right or drive side

to be that as illustrated in figure 2.

19. The Gautier patent discloses use of four individual rollers 13 underneath the lower die roll 2 and 4 individual rollers 16 above upper die roll 1. Figures 4 and 5, column 3 lines 25-54. The rollers 13 are described as engaging the outer peripheries of the die roll tube 20. Column 3 lines 25-30. Rollers 13 are described as receiving all of the downward vertical load from the die rolls which is transferred to the sole plate or cradle 12. Column 3 lines 30-34.

20. The Gautier patent describes two primary advantages of having this frame, journal block bearing and roller 13 construction. The first advantage is reduced vertical forces and wear on the journal blocks 3 and 4 due to the rollers 13 taking the vertical load. Under this construction, Gautier describes that the journal blocks 3 and 4 "primarily will be resisting horizontal forces perpendicular to the plane of the axis 1A and 2A. . . ." Column 3 lines 34-36. From the disclosure, it is my opinion that this "primary" resisting of horizontal forces by the journal blocks 3 and 4 can only come from restraint of the journal blocks by the machined side plate frame 7 as shown in figure 2.

21. The second stated principal advantage of this

particular frame and die roll construction is "the bearing 6 of the prior art system can be completely eliminated." Column 3 lines 36-37. From the Gautier description of the prior art designs requiring four journal blocks as shown in figures 1 and 2, I understand and it is my opinion that the elimination of two of the journal blocks 5 and 6 was considered an important advancement in the '078 invention.

22. As pertinent to the Patent Application, it is also my observation and opinion that the technical disclosure of the Gautier is limited to, or requires the use of, one set of journal block bearings 3 and 4 on the drive side to restrain linear movement of the die rolls transverse to the rotational axes. Gautier states the advantage of eliminating one set of the journal block bearings on the service or window side, but goes no further in explaining or suggesting a device that eliminates the other set of journal bearings 3 and 4 to provide for an open or window in the frame 7 on the drive side. It is my opinion that the Gautier device requires both the individual rollers 13 and 16 as well as the journal block bearings 3 and 4 and U-shaped frame as shown in figure 2 to support and restrain the die rolls 1 and 2 in their operational position.

23. It is also my observation and opinion that the

Gautier patent relies exclusively on the journal block bearings 3 and 4 and the U-shaped frame 7 to restrain the die rolls 1 and 2 from linear movement along the axis of rotation of the die rolls. Although brief mention is made of a drive mechanism, no description is provided for controlling movement in this direction other than the bearings 3 and 4 and frame 7.

24. I have also reviewed U.S. Patent number 4,452,116 for an Assembly for Rotary Die Cutting Utilizing a Shaftless Roll to inventor Kesten (hereafter the "Kesten" patent). Pertinent to the Patent Application, the Kesten patent discloses use of an anvil roll 12 that is mounted in a traditional heavy, machined side plate with bearing blocks 44 engaged with shafts or journals 42 on each end of the anvil. Figure 4, column lines 8-11. Kesten discloses a cutting die roll 16 without a shaft or journal. Kesten uses bearing assemblies 76 having cylindrical bearings 80 which include circumferential flanges 88. The bearing assemblies 76 and flanges 88 are used to provide "lateral stability" to the die-cutting roll 16. Figures 2 and 4, column 6 line 63 - column 7 line 14, column 7 lines 60-68.

25. As explained in paragraph 24 above, the Gautier patent exclusively uses journal bearing blocks 3 and 4 and



frame side plate 7 to constrain the die rolls 1 and 2 along the rotational axes. There is no explanation or suggestion in the Gautier patent to use a different method or to employ the use of an annular flange on one of the die rolls to restrain movement along the rotational axes. It is my observation and opinion that there is no need to add one or more circumferential flanges as shown in the Kesten patent to one or both of the die rolls in the Gautier patent for such a purpose. It is my opinion that an addition of the Kesten circumferential flange 88 to the Gautier die rolls would provide little or no benefit and only add costs and needless complexity to the device. Under these circumstances, it would not be obvious to me to add that Kesten feature to the Gautier device.

26. It is further my observation and opinion that the Kesten circumferential flanges 88 used for the purpose of lateral stability of the upper die roll 16 is a different linear control device as that as shown in the Patent Application. In figures 1, 2 and 6 of the Patent Application, the annular flange 122 serves a dual purpose not shown or explained in the Kesten patent. In the Patent Application, the annual flange 122, in combination with rollers 44 and 48, restrains both the lower die roll and at the same time, the upper die roll along the rotational

axes. This is not shown or described in the Kesten patent.

I declare that all statements made herein are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the patent application or any patent thereon.

By:

ae R.P.H.

Date:

1-5-07

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